

REMARKS

Claims 1, 3, and 5-26 are all the claims pending in the application. Applicant has amended claim 1 to incorporate the features of claim 4, and have canceled claim 4.

Claims 1 and 4-26 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Giza (WO 02/094962) in view of Rubber Engineering (SU 418341; hereinafter R.E. '341), Rubber Engineering (SU 234659; hereinafter "R.E. '659), and/or Suzuki (JP 9-302592). Claim 3 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Giza, R.E. '341, R.E. '659, and Suzuki and further in view of Miller (U.S. 5,458,684).

Claim 1, from which claims 3 and 5-26 ultimately depend, relates to a method of producing a tire cord comprising coating a twisted cord by spraying an adhesive material; and uniformizing the coating of the adhesive material on the twisted cord through an interlacer or a blow nozzle after the spraying, wherein the adhesive material has a viscosity of 50 to 3000 mPas.

The Examiner alleges that Giza discloses applying an adhesive composition to a twisted cord by spraying. The Examiner asserts that the adhesive composition of Giza appears to be identical to that of the claimed invention and therefore it would be expected to demonstrate the claimed viscosity. The Examiner admits that Giza fails to disclose or suggest uniformizing the coating through an interlacer or blow nozzle, but alleges that blow nozzles for removing excessive adhesive are disclosed in R.E. '341, R.E. '659, and Suzuki and therefore it would have been obvious to combine these features.

Applicant submits that the combination of claim 1 illustrates unexpected results over the cited references and that it would not have been obvious to combine the claimed features.

More specifically, a twisted cord has a complicated surface and therefore an adhesive having a low viscosity is used in the conventional technique of applying the adhesive material (see paragraph [0003]). However, when the adhesive material having a low viscosity is used, there is a problem that a harmful substance in the adhesive material emits smoke, and furthermore time and energy for the drying are required for removing the diluent in the adhesive material (see paragraph [0004]). On the other hand, when a coating material having a high viscosity is used in the conventional DIP process or brushing process, there is a problem that a thin and uniform adhesive layer cannot be formed on the surface of the twisted cord and the penetrability into the inside of the cord is poor (see paragraph [0005]).

The invention of claim 1 can solve these problems simultaneously. In particular, it is possible to suppress smoke emission and to save time and energy for removing the diluent in the adhesive by applying the adhesive material having a high viscosity.

Further, a thin and uniform adhesive layer can be formed on the surface of the twisted cord by spraying the adhesive material to coat the twisted cord and uniformizing the coating of the adhesive material on the twisted cord through an interlacer or a blow nozzle after the spraying (see paragraph [0009]). Furthermore, when the viscosity of the adhesive material is limited to 50 to 3000 mPa•s, it is possible to efficiently apply the adhesive material on the twisted cord and also efficiently remove an excess adhesive material.

Accordingly, the invention as claimed in claim 1 has an unexpected effect as a production method, and therefore is not obvious over Giza, R.E. '341, R.E. '659 and Suzuki.

Applicant summarizes some generalized features of the cited references and of the presently claimed invention below:

| | Applying method of the adhesive material | Removing method of the excess adhesive material |
|----------------------|--|---|
| Giza | Dip (Immersion) | Squeeze rolls |
| Giza | Spray | no teaching |
| R.E. '341, R.E. '659 | Dip | Blow nozzle |
| Suzuki | Dip | Blow nozzle |
| Present invention | Spray | Interlacer or Blow nozzle |

As described above, any one of Giza, R.E. '341, R.E. '659 and Suzuki (JP 9-302592) fails to teach or suggest a combination of spraying the adhesive material and the use of the interlacer or the blow nozzle, and as discussed above this combination produces an unexpected effect.

Furthermore, there is no suggestion or motivation for combining Giza with R.E. '341 and/or R.E. '659 as suggested by the Examiner, in the references themselves or in the knowledge available to one of ordinary skill in the art, at least not without resorting to impermissible hindsight. As discussed above, the references that teach a blow nozzle, teach coating the cord through the use of a bath or DIP process (*see* Abstracts of R.E. '341 and R.E. '659) or removing cleaning liquid by blowing air after the cord has been immersed in a fountain (8) of cleaning solution (8a) (*see* Abstract of Suzuki; paragraph [0011]). The DIP process as taught by R.E. '341 and R.E. '659 or a fountain immersion as taught by Suzuki, however, cannot produce a sufficiently thin and uniform adhesive layer on a cord if the adhesive material has a high viscosity (*see* Applicant's Specification, Paragraph [0018]). On the other hand, Giza teaches

coating the cord through a spray process (*see* Giza, col. 8, lines 64-66). The spray process as taught by Giza can produce a sufficiently thin and uniform adhesive layer on a cord if the adhesive material has a high viscosity, but Giza does not teach using a blow nozzle.

Thus, Giza and R.E. '341/R.E. '659/Suzuki teach fundamentally different methods of coating a cord, requiring different viscosity of adhesive material in order to produce a sufficiently thin and uniform adhesive layer on the cord. Accordingly, Giza and R.E. '341/R.E. '659/Suzuki are inapposite at least due to the disparity pointed out above, and the only possible motivation for the Examiner's proposed combination would have been Applicant's own disclosure, the reliance on which constitutes impermissible hindsight reconstruction under MPEP §2143 (*see also* *In re Vaeck*, 20 USPQ 1438 (Fed. Cir. 1991)).

In light of the above, it would not have been obvious to use blow nozzles typically used in a DIP process for a fundamentally different process that includes spraying. Therefore, Applicant submits that claim 1 is nonobvious over the cited references.

Furthermore, Miller fails to cure the deficiencies of Giza, R.E. '341, R.E. '659 and Suzuki. Because claims 3 and 5-26 ultimately depend from claim 1, these claims are patentable at least by virtue of their dependency.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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